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ABSTRACT

This paper focuses on issues in the development of a technology support program for special education, particularly directed toward states with small, wide-spread populations. A three-level approach is suggested, with concentrated central expertise, regional resource points, and a network of individuals at the local level. The technology involved takes many forms, including special therapeutic technology, special education technology, personal assistive devices which facilitate education, and special adaptations to regular education technology. The program should provide support in the following areas: summative information, integrative information, specialized evaluation teams, training, equipment demonstrations, low-technology and high-technology approaches, an equipment loan program, and a software library. Other factors to consider in designing the support program are: the special needs of rural areas, an ongoing needs analysis process, ongoing program evaluation activities, links with existing resources, and possible sources of funding. The steps in planning a state-wide technology service delivery program are outlined. (JDD)

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ISSUES IN PLANNING A STATE-WIDE TECHNOLOGY SERVICE DELIVERY PROGRAM FOR SPECIAL EDUCATION

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INTRODUCTION

There is no doubt that properly applied technology can facilitate many activities, including the education of individuals with special needs. Improper technology, as well as the improper application of the correct technology, however, both usually result in large expenditures of time and money with little, no, or negative results. In addition, a poorly conceived technology program which fails can cause discouragement and loss of support for this important area. This paper focuses on some issues that should be borne in mind in the development of a technology support program for special education. The comments are particularly directed toward programs for a state like Wisconsin, which has a small population and large thinly populated areas.

CENTRALIZED AND DISPERSED

One challenge in developing a technology support system is developing a model which provides the concentration necessary to maintain technical depth and expertise as well as the dispersion required to serve the entire state. Technology today is moving and advancing at such a rate that it is not possible for individuals to keep on top of it part-time. In fact, it takes different individuals who divide the area and each study a portion in order to stay on top of developments and be able to separate the wheat from the large amount of chaff in this area. In addition, technological advances result

in a need for fairly rapid turn-over of equipment. Although the advent of new equipment does not mean that older equipment is obsolete, the support/resource system for a state does need to continually secure and evaluate newer equipment as well as computer software in order to determine which equipment and programs should be considered for wider use. This is an especially difficult task for the non-computer-based technology aids (sensory, communication, writing, mobility, and manipulation education and therapy aids).

This need for depth of knowledge and equipment is best met through one or two major centers. These centers by themselves, however, would have great difficulty in meeting the dispersed needs of the whole state. The quality of technical assistance is likely to be a function of the proximity to these centers, leaving most of the state poorly served. The converse (a wide network of interconnected centers dispersed across the state), however, would either be extremely expensive (to staff many centers) or would not provide enough concentration to develop any depth of expertise (if centers were too small).

One model to achieve this would be a three-level central/regional/local format. A central center could provide the coordination, a central equipment inventory system, a comprehensive demonstration area, and a source for training and the development of resource materials. Star centers around the state would provide regional resource points for consultation and support. Finally, the individual resource personnel dispersed throughout the various school systems would provide the base for the network. These resource personnel would work with other teachers and therapists to help disseminate, apply, and support the technology directly at the application level.

DIFFERENT TYPES OF TECHNOLOGY

The term "technology" or "special education technology" is tossed around in ways that suggest that it is some homogeneous group of devices or equipment. In fact, it takes many very distinct and different forms. Some of these different forms are:

1) Special therapeutic technology;
2) Special education technology
3) Personal assistive devices which facilitate education;
4) Special adaptations to regular education technology.

These different types of technology each play different roles, each have different constraints, and each require different types of support mechanisms.

Special education and special therapy technologies are designed to be tools that the teacher or therapist masters and uses within the education or therapy program. Teachers/therapists throughout the state need to be made aware of appropriate technologies, need to have a mechanism for sifting through the vast number of devices and software packages becoming available in order to determine what is appropriate for their needs, and need to have a mechanism for acquiring the training necessary to effectively incorporate these tools in their clinical/educational practice.

Personal assistive device technology, on the other hand, is not used by the teacher so much as by the student. Devices in this category can range from power wheelchairs to communication prostheses to electronic writing systems to reading aids. Often, specialized expertise, training and experience is required in the selection and fitting of these technologies which is not required for their use or incorporation in the classroom.

Special adaptations to standard educational equipment is different again. Here, the goal is to allow an individual with a handicap to be able to use the same pieces of educational equipment and/or software as are being used by the rest of the students. In this case, no additional training in the use of the standard technology is necessary, since it has already been incorporated into the classroom. Instead, specialized technical expertise, and perhaps therapeutic expertise, is required in order to identify and install a modification to the educational equipment so that it can be operated by the student with special needs. Once the problem has been evaluated and the adaptation identified and installed, support becomes fairly straightforward, involving maintenance and monitoring of the adaptation's effectiveness.

Some of the support described above is best delivered through centralized evaluation and technology support centers which can afford to stock the full spectrum of appropriate devices and maintain staff with specialized training. Other aspects of the support are best provided through regional or local personnel who can provide on-site training and/or models for the use and incorporation of the technologies.

TYPES OF SUPPORT

The primary need for a technology system is support, not delivery. The purpose of the system therefore should be support; and it should be a Special Education Technology Support System. Some of the types of support provided by this system should be:

SUMMATIVE INFORMATION - Summary listings and descriptions of the various pieces of technology that are available should be provided. These catalogs can serve as a central reference point for browsing as well as for looking up information on particular devices or systems. This type of information is particularly valuable for

teachers and clinicians in remote locations who do not otherwise get the chance to see the different devices and technologies.

INTEGRATIVE INFORMATION - This is partially digested and summative information. Mass lists of everything available may be useful for browsing and for looking up items when one already knows what one wants, but it provides limited understanding. Integrative information, on the other hand, provides the clinicians who are less familiar with the technologies with materials which help them understand the various types of equipment and their functions. It also provides them with suggested initial choices for those just beginning in an area, as well as guidelines for selection of materials for specific needs.

SPECIALIZED EVALUATION TEAMS - Where specialized personal assistive devices or special access adaptations are required, the system should provide specialized teams with the necessary equipment, training and experience required to select and fit the device/interface. It should also provide follow-up and support to the teacher/clinician for those devices or adaptations that require it.

TRAINING - Training is necessary on many levels. It extends from a general awareness of the different technologies and different support systems provided by the Special Education Technology Support System to direct training in the implementation and application of specific technologies. Some of this training can be provided through central or regional facilities; other training will need to be provided on an in-service basis at the school sites throughout the state.

EQUIPMENT DEMONSTRATION - Hands-on experience with equipment is essential for its understanding. A central demonstration area can help to meet this need. In addition, however, regional and perhaps traveling equipment demonstration facilities will be

required in order to provide teachers in remote locations with opportunities for hands-on experience with the various technologies.

LOW TECHNOLOGY SUPPORT SYSTEM - In many ways, it is easier to support high technology than low technology solutions. For one thing, high technology solutions are better documented, and generally fewer in number. For another, manufacturers generally do a better job both of advertising and supporting these approaches. Finally, there is more glamour and it is more "fun." Yet low technology approaches are often more effective and easier for school systems to implement. Specific provision should be made in the Special Education Technology Support System for provision of information and support for low technology solution strategies.

EQUIPMENT LOAN PROGRAM - An equipment loan program can be a very cost-effective component of a technology support system. Half or more of the technology that is recommended today for specific clients turns out to be inappropriate or ineffective. Often it ends up in a closet, and the student ends up without anything. Equipment loan programs can provide a mechanism for trial of equipment prior to permanent placement. They can also provide a mechanism for assistance to individuals who are temporarily disabled, or who are waiting for systems that have been ordered but have a long delivery period. The equipment loan program can be fully centralized, where all aids are warehoused and maintained at a central location, or it can have multiple distribution points coordinated through a central facility.

SPECIAL ENGINEERING SERVICES - In order to handle special adaptation needs, specialized rehabilitation technology services should be available through the system.

SOFTWARE LIBRARY - The fastest growing area of rehabilitation technology is special education software. New programs are constantly being announced and released. The

cost to secure and try out the software, however, is prohibitive. A system of central and regional software evaluation libraries should be provided.

EMPHASIS ON RURAL SERVICE DELIVERY PROGRAM

A popular belief is that individuals with disabled children tend to gravitate toward urban centers. This in turn implies that the need for special education technology would be greater in the urban centers. In fact, recent research calls this assumption into question. Mattas (1983) found that the incidence of individuals with severe communication impairments was twice as high in rural as in urban areas (6% of the special education rural population versus 3% of the special education urban population). Preliminary results from the State of Nebraska (Beukelman, personal communication) is finding almost identical results to those found in the State of Washington. The fact that the incidence of severely speech impaired individuals were also twice as high as the general population in rural versus urban centers (6% of rural, versus 3% of the urban total population) further suggests that this is not a relative number, but that there may in fact be twice as many individuals requiring technology in rural settings, at least in this area of need. Since a large portion of the population of Wisconsin is in rural areas, very special attention needs to be paid to determining where the needs lie and in developing a good rural service delivery system.

NEEDS AND POPULATION STUDIES: INITIAL AND CONTINUAL

Clearly, any technology delivery plan for the state should start with a good needs and population analysis. However, an ongoing needs analysis should also be built in to any technology delivery system. This should be coupled with an evaluation program within the Special Education Technology Support System. Over time, the needs of the state should change, as the technology delivery system evolves. A good needs tracking and system evaluation program can help to identify the changing needs as well as

weaknesses in the technology support system so that future program development can be optimally directed.

SPECIALIZED VS. GENERAL SPECIAL EDUCATION TECHNOLOGY

Although technology in special education is at the cutting edge today, it will not be very long before some types of technology are as common in the classroom as books or blackboards are today. Such widely used technologies will not require the same special support as they do now. They can and will be supported through local school systems in the same way that audiovisual equipment is supported today. Special technical consultants may be required for some of this equipment, but they will be present on the local scene, often as a part of the regular school staff.

Other technologies, however, will continue to be specialized in nature. These technologies will generally be in the personal assistive device or special adaptation categories. In general, these technologies are very specialized, and are not needed en masse within any school or school district. As a result, it is not cost-effective to develop or maintain experts or teams for these technologies on a local basis. Regional or centralized centers for these technologies will be the most appropriate. It is also probable that the state resource programs for these various technologies would not all be located in one place. For example, the state central resource programs for visual aids, for deaf aids, and for augmentative communication aids may all be located at different places in order to take advantage of existing centers of expertise in these areas.

LINKING TO EXISTING CENTERS

Of particular importance in setting up a good resource program for a state is taking advantage of key resources in centers which already exist on a local, state, or national

basis. A good technology support system can be incredibly expensive if one attempts to build it from scratch. Unfortunately, a mediocre technology support system can do as much harm as good, due to the high cost of misinformation and over-application or misapplication of technology. By careful utilization of already existing programs on a regional and national basis, however, considerable expertise can be tapped for the support system without incurring the tremendous cost of maintaining expertise. There are national information systems, for example, as well as specialized centers that generate summary resource materials. Each state has different facilities within its borders that can also be used. By either incorporating these programs in the state's support network, or by subcontracting specific services to be provided to the network, the already existing expertise in these respective areas can be very cost-effectively tapped. These same programs should also be tapped for key advisory members, both to assist in setting up a state's technology support system and to monitor the operation and improvement of the system over time. Such an advisory committee should also include individuals from other states having technology support systems. This can be a particularly effective way to share both good ideas and mistakes in this new area.

TECHNOLOGY FUNDING

One of the most difficult areas is the topic of technology funding. Securing funding for technology can be difficult, even when technology can be shown to directly result in more savings than the cost for the technology. One of the first steps in setting up a technology support system will be identifying the various options and opportunities for technology funding. In some ways, this is a chicken-and-egg situation. The number of resources available to pay for the technology at the present time is limited by the ability of technology to demonstrate its cost-effectiveness, which is in turn limited by the lack of effective resource and support systems for technology. Even

when limited technology funding, however, a strong technology support system for a state is important. In fact, when technology application resources are limited, it is most important that the funds available be spent in the most informed and effective manner.

FOLLOW-UP AND FOLLOW-ALONG

Finally, it is important to stress the need for both follow-up and follow-along in the delivery of rehabilitation technologies. Follow-up is defined as a periodic check with individuals who have received services through the system. This includes both professionals and students. Follow-along, on the other hand, is a more continual tracking of the individual's progress and assistance in carrying through any recommendations.

Follow-up is mostly used to catch serious problems and to evaluate the effectiveness of the support system. By checking periodically with the individual's receiving support, it is possible to determine when the recommendations or support being provided are insufficient or inappropriate. Both lead to remedial action with that particular recipient, and also to better design of the overall support system.

Follow-along is targeted more toward providing on-going support to programs or individuals throughout the rehabilitation/education process. Some of the activities of the support system have follow-along so integrally built into them that it is of no concern. Other activities (special in-service seminars, special evaluations, etc.) are inherently one-time activities. If they do not have specific a follow-up/follow-along component attached to them, they are usually substantially less effective and appropriate than they could/should be.

In a well-designed, three-layer system, most of the direct service delivery to students would occur at Level 3. In most cases, these individuals are close enough to the students themselves that follow-up and follow-along can be done fairly easily. Time, however, needs to be budgeted for this process.

STEPS IN PLANNING A STATE-WIDE TECHNOLOGY SERVICE DELIVERY PROGRAM

There is no step-by-step procedure that can be delineated for developing a state-wide program. Although the NEEDS within different states are generally the same (numbers and types of disabilities per capita do not significantly vary), the CONSTRAINTS and the RESOURCES can and do differ significantly. Constraints include the total size of the population to be served, the geographic distribution, political considerations, the structure of the educational system within the state, etc. The resources include specialized centers or programs in the state or region, individuals and programs within the state, and the existing structure of the educational system.

Some general steps that might be taken in setting up a technology support system in a state would be:

1) Formation of a small study group:
   3-4 people, including key interested individual(s) from the state education system and individuals with technology and special education background.

2) Identification of resource personnel:
   on national and state basis, who can be used for consultation. Individuals from this pool can later be chosen for the advisory committee as the process becomes more formal.

3) Identification of resources in state/area:
   Based upon a preliminary armchair/literature-based needs analysis, examine

the state to find out what resources already existing, including special centers and structures within the educational system.

4) Design and conduct a needs analysis study:

Make a moderate attempt to identify the distribution and characteristics of the needs within the state; as time progresses, this step may be less necessary as studies by other, similar states are conducted and published. At this point, however, there is insufficient information in the literature, and considerable risk of false assumption in this area.

5) Identify the funding resources:

It should be kept in mind that the primary function of the support system is not to provide equipment, but to support the provision and use of the equipment. If the equipment is truly an effective part of either the rehabilitation or the education of these individuals, it should in general be provided through the same mechanisms as all other rehabilitation or education services. Nevertheless, funding is an important component, and resources and policy should be identified early so that expectations and support systems can develop appropriately.

6) Start out on a medium to small, semi-centralized basis:

It is impossible at this time to design a comprehensive support system. The resources and expertise do not exist throughout the system; the technology is not ready; and we simply don't know what the final system should look like. A semi-centralized program consisting of a central support center working with both regional centers and special expertise centers is recommended in order to provide a cost-effective mechanism for developing and maintaining expertise while still being able to disperse the expertise through the state. Over time, the number of regional centers can grow and develop more and more local (third-level) formalized affiliations.

7) Initial focus on information and training:

Although initial expectations of the technology support system may be that it will supply technology, its primary products in fact should be information, training, and special evaluation (through its specialization centers). Although the state may decide to distribute equipment through

the program, this should be done ca[illegible]ly and in conjunction with its specialized evaluation centers.

In Summary

There is decidedly a need for the development of technology support systems within states, in order to enable special education programs to take effective advantage of the newer technologies being released. Setting up such a system, however, is not a straightforward task, and the best form for this support system would vary from state to state. A three-layer approach is suggested which provides for concentrated central expertise, regional resource points, and a network of individuals at the local level. The focus of this system should be on support rather than equipment distribution, with an emphasis on information, training, and specialized evaluation. It is further suggested that a network of support systems between states be established in order to minimize duplicated effort in the generation of new materials and to maximize utilization of the expertise and experience of the different support programs.

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